Enter the Chief Energy Officer—Lessons From The Evolution of The IT Industry

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ABSTRACT

The energy services industry is undergoing a renaissance due to the volatility and uncertainty in energy and utility markets. As companies seek to better manage their energy costs and usage, and as energy service providers seek to grow and evolve their businesses, they can derive useful lessons from the evolution of the IT industry over the last 50 years. We should expect to see the emergence of *energy integrators*, service providers who can combine technology platform independence with the senior management perspective needed to help large organizations make and implement the myriad decisions required to manage energy and carbon at an enterprise level.

SUMMARY

Important lessons can be learned for companies seeking to better manage their energy usage by examining the evolution of the IT industry and its ecosystem of hardware, software, and integrators. Foremost among these is that they should expect more capable service providers to emerge and energy-related issues to become more strategic to the conduct and planning of their businesses.

INTRODUCTION

It is a truism that any aspect of a business's operations or cost structure that is sufficiently stable and low-cost will both receive little

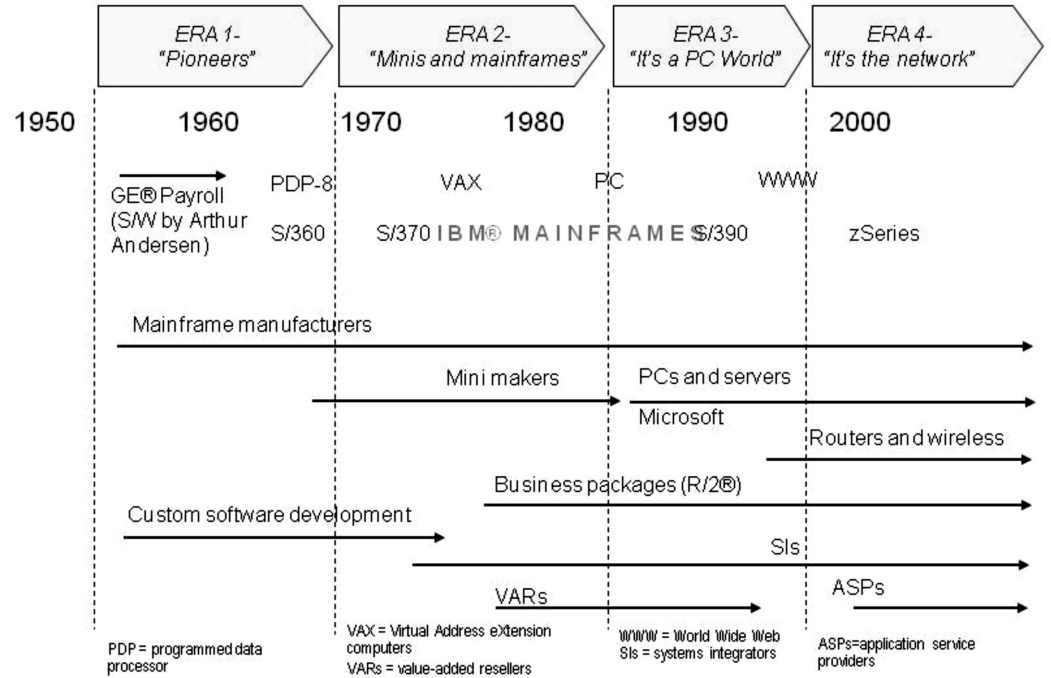
management attention and fail to create economic niches for innovative service providers. The long-standing reliability and low cost of our energy infrastructure (in the public utility model) has resulted in just such a situation. Five or ten years ago, only a few industries such as primary metals would have paid any attention to energy usage. Issues around energy were seldom considered in the executive suite, and as a consequence the ecosystem of energy services providers was truly a niche.

In contrast, over the last 50 years, the information technology (IT) industry has developed a rich, complex, and highly dynamic ecosystem of hardware, software, and service providers that grew and responded to the growing needs and critical nature of IT within business operations and strategy. At the same time, the role of IT management morphed and grew until the chief information officer became an expected occupant of the C-suite in most companies.

If in fact energy costs, reliability, and volatility do become ever-larger issues in both the public and private sectors of the economy, what lessons can we learn from the evolution of the IT sector that can help companies prepare to manage energy better?

EVOLUTION OF THE IT INDUSTRY

The pace of change in the IT industry over the last half-century has been tremendous. While we don't have time here for an in-depth history of IT, we can see from an overview that one can divide the evolution of the industry into phases, most marked by adoption of technological breakthroughs (Figure 1). If we limit ourselves to electronic computing (and leave punched card tabulators off the page), we begin in the 1950s with the first application of business computing in the U.S. by General Electric Company. This first strategic era was dominated by mainframe computers, their manufacturers, and the providers of the custom software that ran on them. In many cases, this was the manufacturers themselves, but from the very start, expert third-party providers were involved. (The piece of Arthur Andersen that was to become Accenture was contracted to write software for that first GE payroll computer.) Through this first era, though, it was the computer manufacturers themselves that dominated the ecosystem; for example, the American Airlines' SABRE® system (now a trademark of Sabre



GE is a registered trademark of General Electric Company in the United States and/or other countries.
IBM is a registered trademark of International Business Machines Corporation in the United States and other countries.
R/2 is a registered trademark of SAP AG in Germany and several other countries.

IT Industry Evolution

Figure 1

Mark Limited Partnership) was jointly developed with International Business Machines Corporation (IBM®) and ran on IBM mainframes.

The second era can be seen as including the emergence of both minicomputers and integrated business software packages like SAP AG's SAP® R/2® in the 1970s. It is with these innovations that the world of value-added resellers (VARs) and integrators took off. The third era can be considered as having begun with the penetration of the PC into businesses in the mid-80s. This made Microsoft Corporation a key player in the enterprise, but it also provided a far broader playing field for independent software developers and device manufacturers while greatly increasing the penetration of computing into business processes. Finally, the emergence of networking, the web, and mobility has characterized the fourth era, as we move increasingly to a Nicolas Carr world of utility computing. In this world, though, some business models like VARs have become less important as original equipment manufacturers (OEMs) have been able to co-opt some of their functions.

So, how can we characterize the way companies have managed their own IT operations through these eras? Certainly, there has been diversity and experimentation, but it is not too far off to describe the initial Era 1 model as having bespoke engineering in conjunction with the technology of the time. In the second era, IT was the purview of the management information system (MIS) manager, sequestered down in the organization and responsible for delivering reports and information but rarely if ever a business leader or strategic advocate. This made sense; his/her systems were relatively inflexible and, outside of a few industries such as airlines or financial services, probably delivered little in the way of competitive advantage. So too, expenditures were relatively easily managed, because they were centralized, and the average employee could have little impact on IT spending through day-to-day activities.

In the third era, as the PC penetrated the enterprise, hardware and software purchasing blossomed, and systems and services began to be demanded by an ever-larger set of employees; the role of the VP of IT and eventually the chief information officer (CIO) came into being. As IT became both a larger part of the cost structure (all those PCs and servers), as business processes became more IT-enabled, and as IT itself showed it could drive comparative advantage, the need to include an enterprise view of information in strategic business decisions grew; so too did the need to manage and prioritize costs. IT was becoming an ever-larger part of the corporate cost structure. (From 1977, the earliest

government data available, to today, it has grown five-fold as a percentage of gross domestic product [GDP], during which time GDP itself has grown seven-fold.) With a computer on every desk and a cell phone or smartphone in every briefcase, IT usage choices by the entire employee population now drive IT costs and priorities.

Today, the IT services industry is a rich, complex, and dynamic space with a multitude of roles and competing and complementing business models (Figure 2).

LESSONS FOR ENERGY

What lessons does this history hold for how organizations manage their energy usage? First, it is valuable to recognize that the electrical industry, in fact, went through a very similar evolution as described by Nicolas Carr in *The Big Switch* (Figure 3). However, today we face an inflection point. Energy is no longer an insignificant and unchanging part of the cost structure, its use is no longer without broader consequences and implications, and its availability and reliability is no longer universally or optimally guaranteed by a simple contract with a single utility provider. Instead, the enterprise faces new choices and new options for how to manage this long-neglected resource.

Before we draw lessons, let's recognize that bits and joules are not in all ways similar. Society has benefited from decades of engineering experience and standardization in energy usage, and the new complexity we see is driven by new technological options and rapidly increasing prices. Digital data have proprietary content associated with them that electrons and fuel do not, and few indeed are the employees who could put a business at risk in terms of its energy usage the way a careless email or server configuration might. For these reasons and more, we need to be rational in the lessons we draw from the IT analogy.

First, we will likely see the emergence of entirely new categories of service providers in the energy arena, from the outsourcing of management functions to whole new IT-enabled energy management solutions. Automated tools may make the "bespoke engineering" of traditional energy assessments more comprehensive and frequent. Just as IT providers (not counting IBM!) went from specialists known only to a small circle of industry participants to household names, so too may we see some segment of energy services providers become far better known, at least

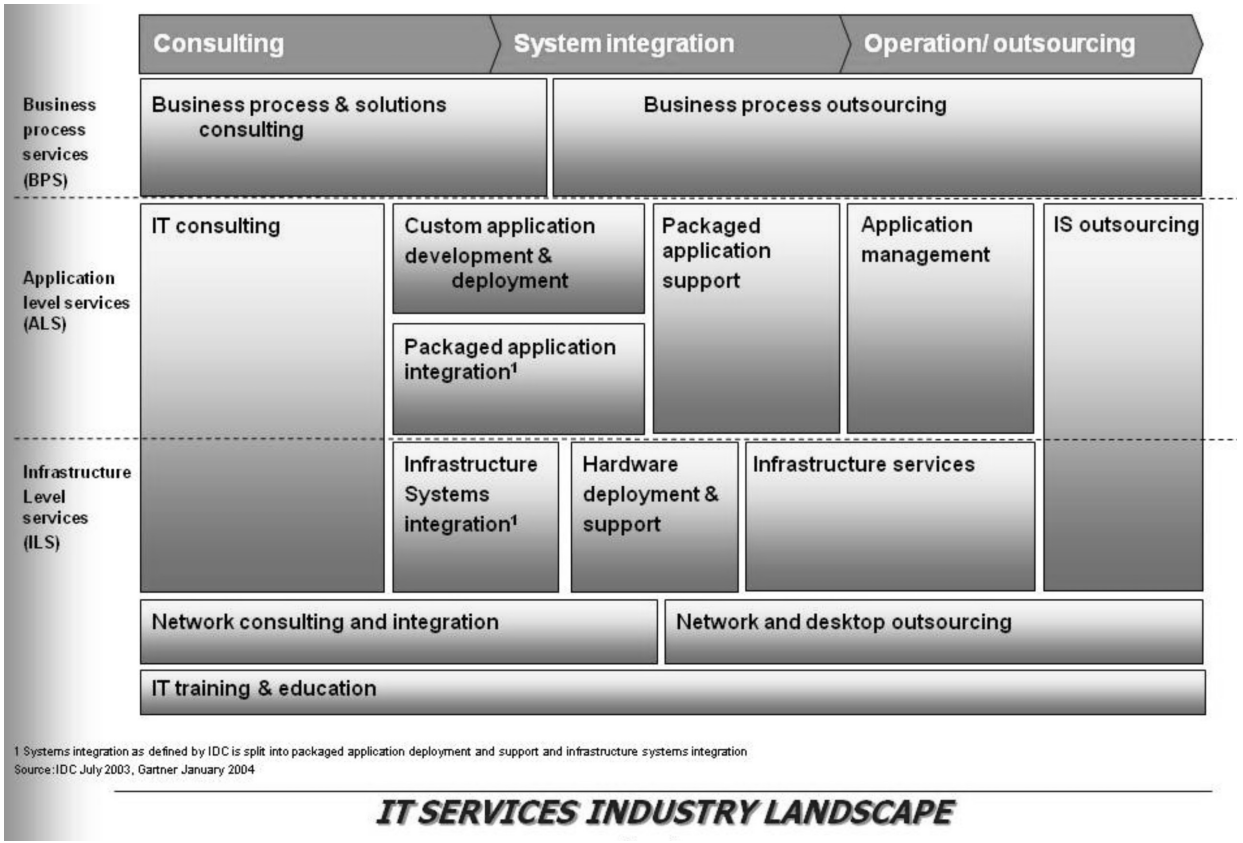

Consulting
System integration
Operation/ outsourcing
Business process services (BPS)
Business process & solutions consulting
Business process outsourcing
Application level services (ALS)
IT consulting
Custom application development & deployment
Packaged application integration1
Packaged application support
Application management
IS outsourcing
Infrastructure Level services (ILS)
Infrastructure Systems integration1
Hardware deployment & support
Infrastructure services
Network consulting and integration
Network and desktop outsourcing
IT training & education
1 Systems integration as defined by IDC is split into packaged application deployment and support and infrastructure systems integration
Source: IDC July 2003, Gartner January 2004
IT SERVICES INDUSTRY LANDSCAPE

Figure 2

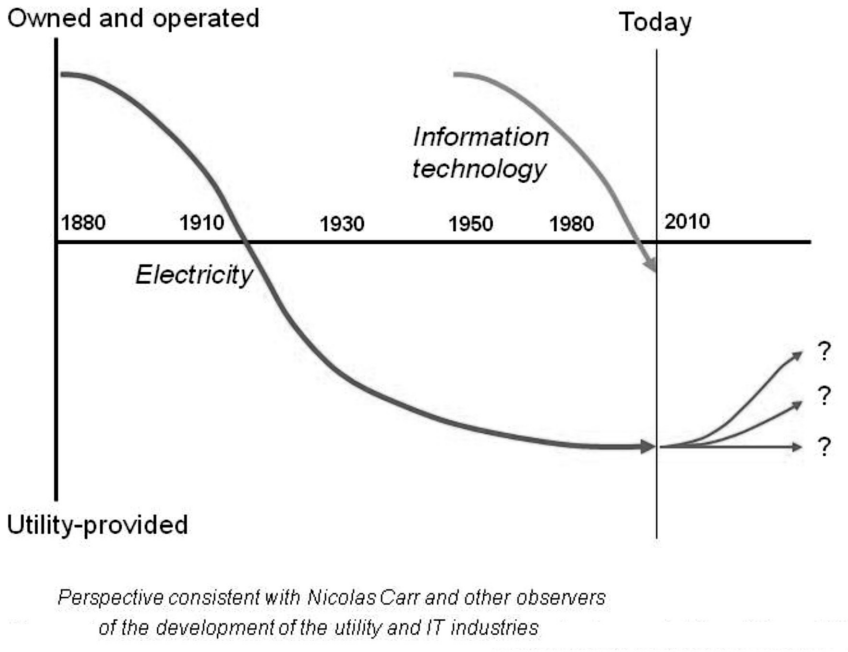


Figure 3

in the business world. Just what portfolio of services these providers will offer remains to be seen, as does the eventual business model(s) that will emerge victorious. It does seem likely that over time software will become as essential as hardware in designing energy solutions for most customers' complex operational needs.

Second, the tradeoffs brought into being by the availability of real-time pricing of power, the plethora of distributed generation options, and an ever-increasing list of OEM options for major and minor energy consuming devices will put a premium on engineering excellence and breadth for service providers. We should expect to see both broad service providers and niche specialists going to market as teams to solve difficult problems, much as IT services players have done, and just as in IT we should expect an actively changing industry landscape shaped by mergers and acquisitions. One example of what the industry might look like in the future is illustrated in Figure 4. Just as expertise in managing IT vendors and integrators is essential for the CIO today,

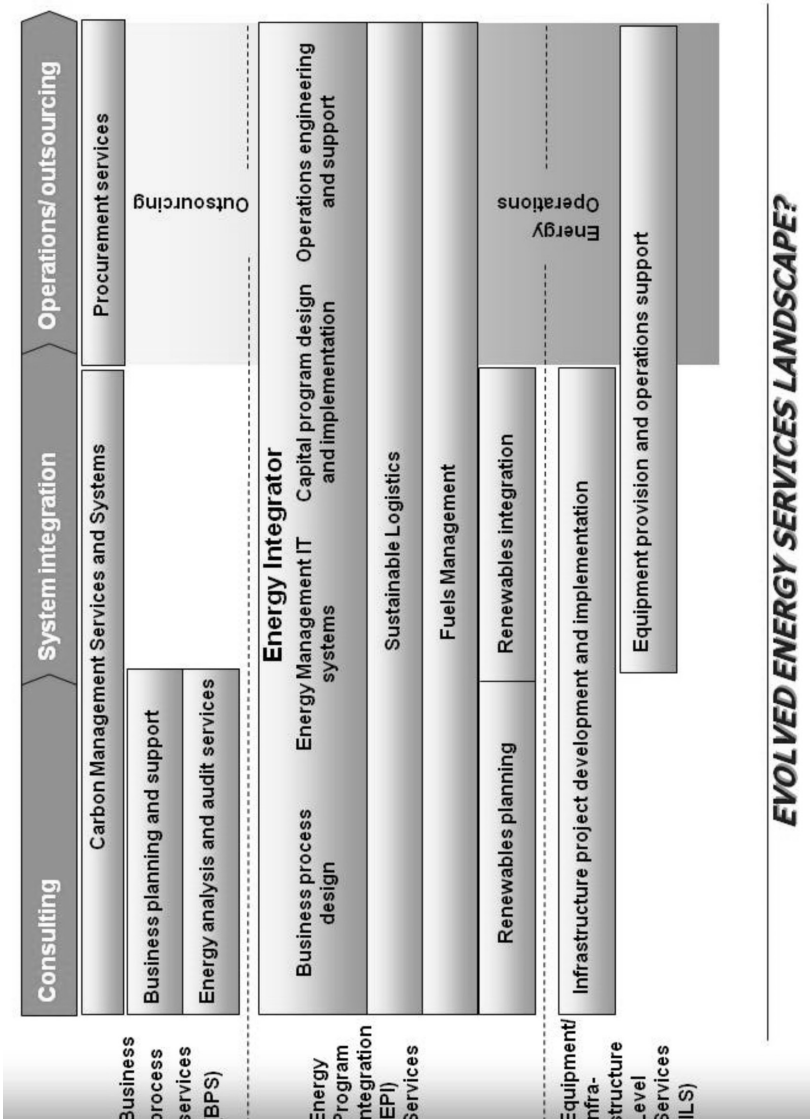

Consulting
System integration
Operations/ outsourcing
Business process services (BPS)
Carbon Management Services and Systems
Business planning and support
Energy analysis and audit services
Procurement services
Outsourcing
Energy Program Integration (EPI) Services
Energy Integrator
Business process design
Energy Management IT systems
Capital program design and implementation
Operations engineering and support
Sustainable Logistics
Fuels Management
Renewables planning
Renewables integration
Energy Operations
Equipment/ Infra-structure Level Services (ILS)
Infrastructure project development and implementation
Equipment provision and operations support
EVOLVED ENERGY SERVICES LANDSCAPE?

Figure 4

expertise across this Energy Services landscape may be crucial for senior management in the future.

Third, energy will continue to grow in importance as a strategic and operational issue for organizations in a variety of economic sectors. Today it may be handled as just another commodity by a general purchasing organization, but over time, the complex tradeoffs between sourcing, operational management, engineering redesign, and capital deployment that all play into energy management will require a much higher level of executive attention. Add in concerns over carbon footprints, regulation and legislation, and impact on brand, and we can see that this becomes a far more strategic issue than has been recognized. As an example, just as real estate expertise was the lynchpin for McDonald's Corporation's expansion of their retail footprint, so now does energy expertise serve as a lynchpin of expansion of cloud computing data centers. Making this happen takes a systems and enterprise view.

Does that mean a chief energy officer is in store for most companies? Probably not—aside from the unfortunate acronym. For most industries, energy usage and the choices around it will not have the same level of technological challenge and speed of change that brought the CIO into being. However, it is far more likely that a senior executive with access to both the chief operating officer and chief financial officer will be needed to drive the multifunctional decision making that will be required to make smart business decisions around energy and sustainability in the coming decade. This is the only way for companies to take a truly enterprise view of energy and carbon usage. Having both internal and external resources to reach out to when considering a reconfiguration of business or industrial processes, for example, will create a truly value-added role for someone able to combine energy expertise with operational and financial credibility and a senior management point of view.

ABOUT THE AUTHOR

David M. Speiser joined Science Applications International Corporation (SAIC) in 2004 and is senior vice president for strategy. In this role, Dave serves as deputy to SAIC'S executive vice president of corporate strategy and is responsible for improving SAIC's strategic planning process, driving corporate-level strategy, interfacing with the mergers and acquisitions function, and serving as a resource for the

group presidents on their most important strategic initiatives. Until recently he was Senior Vice President of Strategy and Strategic Planning for the Infrastructure, Logistics, and Product Solutions Group, one of SAIC's four business groups with over $2B in annual sales. In this role, he was responsible for driving portfolio strategy, business strategy, and leadership initiatives in specific markets.

Prior to joining SAIC, Dave was a consultant with McKinsey and Company, as an associate from 1994 to 2001 and a principal from 2001 to 2004. During his tenure at the firm, Dave was a leader in the aerospace and defense practice, serving defense prime contractors, commercial aerospace firms, systems manufacturers, and technology providers. In addition, he served both corporate and private equity clients in satellite communications and broadcasting.

Before joining McKinsey, Dave was a post-doctoral researcher focused on heavy metal tolerance and plant molecular biology. He received his Ph.D. in biochemistry from the University of California at Berkeley (1989) and his A.B. in biochemistry and molecular biology from Harvard College (1983).

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